AQMesh Operating Manual

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OMAQM3.8

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Please note: the most up to date version of this operating manual can be found online at www.AQMesh.com/manuals

For support options please our website at http://www.aqmesh.com/support/

For Frequently asked questions http://www.aqmesh.com/support/faqs/

Manual guidelines

1.1 Hyperlinks

Hyperlinks to other sections of this manual, websites or email addresses are in the following format:

www.aqmesh.com

1.2 Notes

Important/useful information and instructions are shown clearly throughout the manual in a note format.

For example:

> ✍   Note: For further information please contact AQMesh technical support by emailing support@aqmesh.com or contacting your distributor.

1.3 Safety related information

Safety symbol

Information in this manual that may affect the safety of users and others is preceded by the following symbol:

⚠ Warning

Failure to follow this information may result in physical injury, which in some cases could be fatal.

1.4 Introduction

This manual explains how to install and operate the AQMesh outdoor air quality monitor.

The AQMesh outdoor air quality monitor is designed to measure atmospheric gases and particulates in ambient environments. It has been developed to incorporate the latest design and technology, providing the user with an extremely simple-to-use and flexible monitor that is intended for use in a number of applications.

> ✍   Note: Whilst robust in design the monitor is a sensitive piece of scientific equipment and should be treated as such.

Important notices to all customers

1.5 The AQMesh system

AQMesh has the following features:

- Parts per billion measurements of gases
- Particle count and mass estimation
- Up to two years sensor and battery life, depending upon data frequency, transmission rates and battery type chosen
- NO gas measurement in the range 0 to 4,000ppb
- NO2 gas measurement in the range 0 to 4,000ppb
- O3 gas measurement in the range 0 to 1,800ppb
- Optional CO gas measurement in the range 0 to 6,000ppb
- Optional SO2 gas measurement in the range 0 to 10,000ppb
- Optional particle count 0.3 to 30+ µm
- Pressure measurement range 500 to 1500 mb
- Pod temperature measurement range -20 to +100 ˚C
- Humidity measurement range 0 to 100 %RH
- Wireless GSM communications
- Automatic GPS location (Not Mk1 hardware)
- Secure mounting
- Rugged, waterproof IP65 case design
- Long-life lithium primary or rechargeable NiMH battery options.
- Other power options include 12V D/C, solar panel, external high capacity battery pack or 110-240V A/C mains (using a suitable adaptor),
- Simple installation
- Large or small networks – single pod or 100's
- Data is automatically downloaded to secure server
- Easy access to data via web account or API
- Data tables and graphs
- Data export

Applications

- Site perimeter monitoring
- Traffic hot spot monitoring
- Fugitive emission monitoring
- General air quality monitoring

2.1 General

If practical, protect the analyser from strong direct sunlight as this will quickly raise the temperature of the analyser beyond its operating range. The manufacturer has provided a sun shield to help with the effects of direct sunlight which should be oriented toward the prevailing sun throughout the hottest part of the day.

2.2 Safety instructions

⚠ **Warning**	The AQMesh pods have a back-plate that covers any accessible components which may cause electric shocks or burns. This plate must only be removed when power to the system has been removed.
	Failure to isolate the supply could result in an electric shock or burns.
	It is the responsibility of the owner of this equipment to complete a risk assessment on its installation, operation, and maintenance prior to it being used.

Only suitably trained personnel should carry out the installation in accordance with the relevant applicable codes of practice.

Repair and maintenance of this equipment should be carried out in accordance with the relevant applicable codes of practice by trained personnel.

Only the manufacturers approved components are to be used as replacement parts.

Important notices to all customers

If the equipment is likely to be exposed to aggressive substances, e.g. acidic liquids, gases that may attack metals or solvents that may affect polymeric materials, then it is the responsibility of the user to take suitable precautions.

⚠ **Warning**	When opening the AQMesh pod great care must be taken by the operator. It is the responsibility of the owner of the equipment to ensure that all personnel are adequately trained.
	The equipment should not be altered in any way other than described within this operating manual. Alterations or changes outside of this operating manual could make the equipment unsafe.
	It is vital that the instructions in this operating manual are followed closely. Failure to comply could cause an injury to the operator.

Note: If there is any uncertainty, please contact your local distributor, or our technical support team at the manufacturer on +44(0)1789 777703 or email support@AQMesh.com.

2.3 Range of environmental conditions

AQMesh pods are tested for use in ambient temperatures in the range of -20°C to +50°C. The AQMesh pods are designed for use outdoors and have an IP65 rating.

2.4 Safety symbols used.

The following safety symbols may be used on the AQMesh pods:

	Protective conductor terminal
	Caution, risk of electric shock
	Caution, refer to operation manual.
	Class 2 laser, risk of blindness.

⚠ **Warning**	Where the symbol ⚠ or ⚠ is used on the product, the operating manual must be consulted.

General product label symbols are listed as follows:

CE	CE conformity-The CE-marking is the manufacturer's statement to the EU authorities that the product complies with all relevant CE-marking Directives.		Separate collection, handling and disposal for waste electrical and electronic equipment and its components.
VDE	VDE mark is a symbol for electrical, mechanical, thermal, toxic, radiological and other hazards.	i	Refer to operators manual.
□	Double insulated construction - does not require an Earth.		Equipment for indoor use only.

Important notices to all customers

2.5 Power options

AQMesh pods can be supplied with a number of different power options (specified at time of manufacture).

Power options	⚠ Warning
Internal primary Lithium battery pack. (AQM-BATTERY). Output : 3.6V === 76Ah, 273.6Wh.	Contains Lithium Thionyl chloride Batteries. Do not use if damaged. Fire, explosion hazard if used incorrectly. Do not recharge, disassemble, heat above 100degC, incinerate or expose contents to water. Please do not return if faulty. Dispose of according to local regulations.
Internal rechargeable NiMH Battery pack. (AQM-RECHARGE) Output : 3.6V === 9Ah, 32.4Wh.	Contains NiMH Batteries. Do not use if damaged. Fire, explosion hazard if used incorrectly. Please do not return if faulty. Dispose of according to local regulations. Recharge indoors in an open area on a fire-resistant surface using the manufacturer supplied charger (part no.) only.
External manufacturer battery pack (Option only available at time of manufacture) Output : 3.6V === 456Ah, 1641Wh 3.6V === 200mA. ===	Contains Lithium Thionyl chloride Batteries. Do not use if damaged. Fire, explosion hazard if used incorrectly. Do not recharge, disassemble, heat above 100degC, incinerate or expose contents to water.

Important notices to all customers

	Please do not return if faulty.
	Dispose of according to local regulations.
External DC power (Option only available at time of manufacture) Input: 9-25V === 130mA @9V ===	⚠ Danger risk of electric shock No user serviceable parts. Do not open. AQMesh pods are supplied with 1.5M of arctic grade 2-core electrical cable which should be trimmed and terminated in a suitable junction box.
Solar panel assembly (Option only available at time of manufacture) Input: 12V === 100mA @12V ===	⚠ Danger risk of electric shock and hot surfaces No user serviceable parts. Do not open. AQMesh pods are supplied with 1.5M of arctic grade 2-core electrical cable with military style connectors for connecting the pod and solar panel. Extension leads are available AQM-EXT.

2.6 Storage

When not in use the AQMesh pods should be kept in a clean, dry and ambient temperature environment, such as an office. It should be stored upright on its base which helps prolong the life of the sensors.

2.7   Shipping pods

When fitted with its internal lithium batteries AQMesh pods are considered class 9 dangerous goods. It is therefore not possible to ship AQMesh pods via a normal courier service, or travel with them on any commercial flight, unless you remove the lithium battery pack first.

> ✍ Note: The transportation of dangerous goods is controlled and governed by a variety of different regulatory regimes, operating at both the national and international levels. Collectively, these regulatory regimes mandate the means by which dangerous goods are to be handled, packaged, labelled and transported.

If you are sending pods fitted with lithium batteries to a new location they **must** be packaged accordingly for class 9 dangerous goods and sent via a dangerous goods carrier with all relevant paperwork and notifications.

You are able to ship AQMesh pods which are not fitted with lithium batteries via any normal courier service.

2.8   Moving pods

When you have relocated your pods locally you **must** ensure they go through rebasing in their new environment. This has to be manually selected via the AQMesh server.

The risk of sensor failure is worst when pods are moved around / shipped. Please ensure that RH / temp is changed gradually and the pods are handled gently, particularly when they have been recently exposed to high RH%. For example, when we bring pods indoors we leave them to sit in cool, dry conditions for 24 hours before taking them fully indoors.

2.9   Memory

Data is automatically transferred to the AQMesh server for secure storage and processing. Data is only stored locally when it cannot be transmitted to the server. The internal memory should **not** be used as a permanent storage

medium and any important data should be transferred to AQMesh.net as soon as possible. The monitor should not be stored for prolonged periods with valuable data in its memory. The pod memory should be cleared after any power cycle to avoid potential corruption of its memory leading to loss of data.

2.10 Calibration

The gas sensors fitted into the AQMesh pods are fully calibrated during the manufacturing process and they do not exhibit drift normally associated with other types of gas sensor. However, to confirm accuracy prior to deployment pods can be co-located with industry standard reference equipment and scaled accordingly (please see user advice documents on AQMesh.com/support).

2.11 Cross-gas effects and data processing

The electrochemical sensors fitted into the AQMesh pod suffer cross-gas effects. Measured gases (i.e. NO, NO2, O3) are compensated automatically during post-processing on the AQMesh server. Any unmeasured gases could be the cause of erroneous gas measurements.

> ✍   Note: For further information please contact support@aqmesh.com or contact your distributor.

2.12 Service

If handled and operated correctly your AQMesh pods will last for many years but should go through regular maintenance to ensure correct operation and accurate readings. The manufacturer recommends replacement of all sensors and (if fitted) the internal lithium battery **every 2 years**. The optional particle counter should be routinely serviced annually (more frequent service may be required depending on local conditions).

2.12.1 User serviceable parts

> ✍ Note: Please do not attempt any repair as this may invalidate any warranty supplied with your pod. Only parts supplied by the manufacturer or its authorised distributors can be fitted into this equipment.

The following parts are user-replaceable and can be purchased from your local distributor. Please contact them for further information.

AQM-NO-SENSOR	Spare-NO sensor for AQMesh including data on AQMesh.net
AQM-NO2-SENSOR	Spare-NO2 sensor for AQMesh including data on AQMesh.net
AQM-O3-SENSOR	Spare-O3 sensor for AQMesh including data on AQMesh.net
AQM-SO2-SENSOR	Spare-SO2 sensor for AQMesh including data on AQMesh.net
AQM-CO-SENSOR	Spare-CO sensor for AQMesh including data on AQMesh.net
AQM-3GAS	Spare-3 gas sensor suite for AQMesh (NO, NO2, O3)
AQM-5GAS	Spare-5 gas sensor suite for AQMesh (NO, NO2, O3, SO2, CO)
AQM-BATTERY	Spare-Battery pack for AQMesh
AQM-PM-SERVICE PACK	Replacement OPC pump and laser
AQM-PM-INLET	Spare inlet cap for particle counter
AQM-ANTENNA	Spare-Antenna for AQMesh
AQM-MOUNTBRKT	Spare-Standard mounting bracket for AQMesh
AQM-COMSCABLE	Spare-Communications cable for AQMesh
AQM-TAMPTOOLBIT	Spare-Tamperproof screwdriver bit for use with AQMesh (pack of 10)
AQM-TAMPPIN	Spare-Tamperproof pin (pack of 10) for AQMesh
AQM-FIXINGCHANNEL	Spare-Fixing channel set for AQMesh - includes 2 channel pcs and 4 fixing screws
AQM-LAMPPOSTCLIP-76MM	Spare-Standard post fixing set for 76mm diameter post (pack of 2)
AQM-LAMPPOSTCLIP-89MM	Spare-Standard post fixing set for 89mm diameter post (pack of 2)
AQM-LAMPPOSTCLIP-114MM	Spare-Standard post fixing set for 114mm diameter post (pack of 2)
AQM-BANDING	Spare Banding, steel reel 30.5m x 12.5mm for AQMesh
AQM-FIXTOOL	Spare-Steel banding tool for use with AQMesh standing fixings
AQM-POSTCLIPS	Spare-Universal banding clips for AQMesh (pack of 2)
AQM-BANDBUCKLE	Spare-Universal banding buckles for AQMesh (pack of 2)
AQM-SUN SHIELD	Spare-Sun shield for AQMesh
AQM-EXT	Extension cable (IP67) for solar panel assembly.
AQM-ANTENNA/SOCKET	Spare-Cable, assembly for AQM-ANTENNA
AQM-SCREW (3MM HEX)	Spare-Screw, (3mm hex) for AQMesh (pack of 100)
AQM-BACK PLATE ASSY	Spare-Back plate assembly fitted with gaskets
AQM-2MM HEX KEY	Spare, Hexagon key 2mm, L-shape for AQMesh

Important notices to all customers

AQM-RECHARGE	Spare, pack of 2 AQMesh rechargeable batteries with charger. For use with MK2 or MK3 hardware

2.13 Cleaning

The AQMesh housing and fixings can be wiped clean using a damp non-fibrous cloth. Do not submerge in water. Do not attempt clean the sensor membranes.

> ✍   Note: Do not use solvents or any other chemical cleaners as they may damage the finish and might even adversely affect the gas readings.

Installation

3.1 Tools required

- Basic tool kit.
- Handle for hex security bit.

Each installation is different depending on the site and method of mounting. Therefore, the tooling requirements for placement and fixing of the mounting bracket is not covered by this document.

3.2 Preparation

It is the manufacturer's recommendation that the installation is always carried out in accordance with this operating manual. Any electrical work should be carried out by a competent electrician and the relevant codes of practice should be followed at all times.

⚠ **Warning**	Power should NOT be applied to a pod before all fixings and wiring have been completed and tested.
	Only a qualified competent person should make electrical connections.

In order to effectively install AQMesh pods it is important that the site is ready and in a fit state. In particular, the following points should be noted:

- This operating manual has been read and fully understood.
- A risk assessment has been performed that includes installation, operation, and maintenance of the system and the removal, where practicably possible, of any identified hazards.
- Applicable codes of practice identified.
- The AQMesh pods has been received on site, unpacked, contents checked and packaging checked for obvious damage.

Important notices to all customers

- A suitable location is determined for the installation of the AQMesh pod.
- If required a suitable isolated D/C power supply is installed.

? Note: Failure to comply with any of the above may result in additional time on site and additional costs.

Carefully unpack your AQMesh pod. You should have the following items:-

- AQMesh pod serial number XXXXXXX fitted with its sun shield
- An aerial
- A mounting bracket, four plastic spacers
- A security screw and security screwdriver bit
- 2mm Hex key

? Important: DO NOT POWER UP THE AQMESH POD WITHOUT THE AERIAL IN PLACE AS IT CAN DAMAGE THE ELECTRONICS

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1. Install the aerial to the threaded fitting on the top of the AQMesh pod. Care should be taken to ensure a good connection but don't over-tighten.

2. Remove the AQMesh pod from the mounting bracket. Remove the central security screw from the base of the product and slide the pod upwards to release from the mounting bracket.

Important notices to all customers

Rotate clockwise

Slide pod up
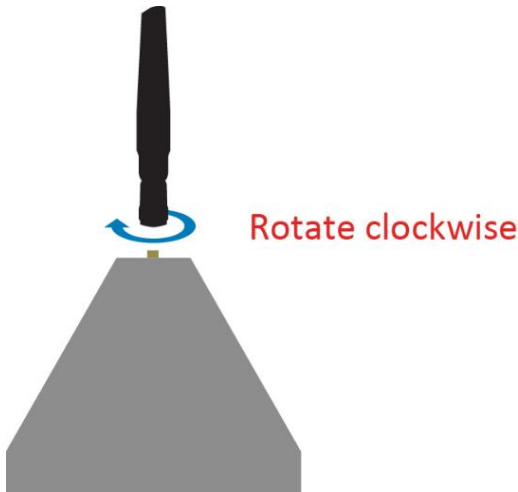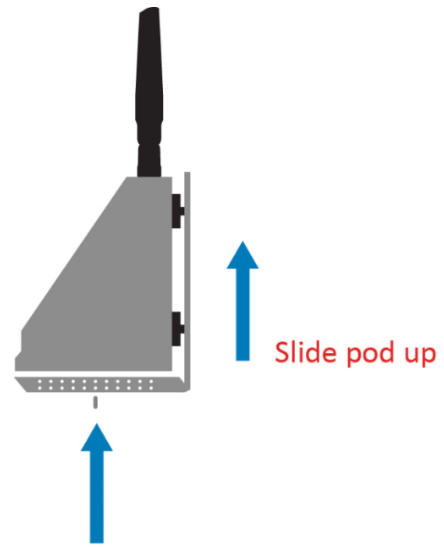
Unscrew security bolt

Fig.1   Fig.2

3.3   Installation method

⚠ **Warning**	Always ensure that you refer to and comply with the relevant National Working at Heights regulations prior to any installation work. Only a qualified competent person should make electrical connections.

Install the pod mounting bracket securely in position where you would like to install your pod. A typical post installation is detailed below, please remember to use the plastic spacers provided. The spacer is there to ensure correct clearance for cables and outlets on the rear of the product. Please use appropriate post fixings and channel.

Important notices to all customers

CLIP INSTALLATION
SCALE 1:2

SECURING MOUNTING CLIPS
SCALE 1:2

MOUNTING BRACKET INSTALLATION
SCALE 1:2

POD INSTALLATION
SCALE 1:2
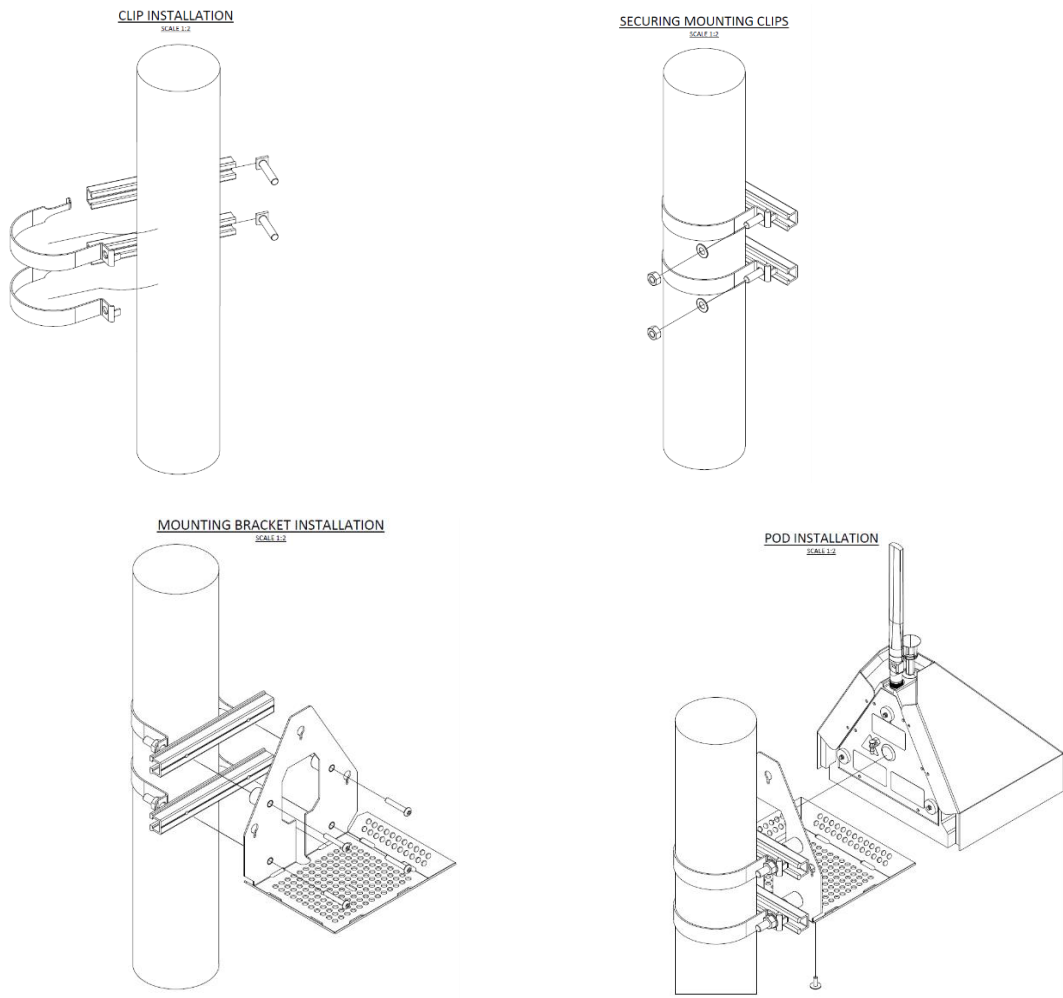
Please consider the following requirements for all potential installation sites.

- Weight of AQMesh assembly (approx. 2.0kg)
- GPRS/3G coverage
- Safety of the public
- Security (the pod is **not** designed to be vandal proof)
- Permissions for access and installation of equipment
- Environmental conditions:-
    o Temperature (-20 to +50 ˚C)
    o Humidity (15-85%)

Important notices to all customers

Please consider the following requirements when positioning your AQMesh:-

- Free access to ambient air
- Mounted clear of flat surfaces where water may collect or direct heat reflect onto the pod
- Away from potential sources of contamination
- GPRS signal strength with its aerial in the upright position
- Orient the sun shield to face the prevailing sunlight during the day
- Orient and angle the solar panel to the prevailing sunlight

⚠ **Warning**	The power cable must enter the pod via the cable gland supplied and the supply should be isolated (see wiring) to allow safe connection.

3.4 Cable conductor sizes and cable insulation requirements

DC cable requirements

For the external DC wiring, the conductor must be suitably selected for the current carrying capacity, the environment, and the distance to the supply. The cable insulation must comply with a recognised standard and have a flammability rating of V1 or better and be suitable for use outdoors in the local environmental conditions.

Important notices to all customers

AQMesh pods are supplied with 1.5M of blue artic grade, 2-core, 1.5mm^2, 300/500V, electrical cable which should be trimmed and terminated in a suitable junction box that is isolated from the main supply.

⚠ **Warning**	Incorrect cable selection or installation could result in a hazard.

3.5 How to wire the external DC supply

⚠ **Warning**	Only a qualified competent person should make electrical connections to the system.
	Ensure the power is isolated before wiring to the system.
	If using armoured cable, the armour must not be used as the main earth connection for the AQMesh pod. If earthing of the armour is required, this must not be taken from the AQMesh pod.
	All cables should be crimped with an appropriate ferrule for the size of the cable being used. In addition, the cable insulation must be housed adequately within the protective sheath of the ferrule.

Refer to **Error! Reference source not found.** for how to wire the cable to an AQMesh pod. Labelled terminals within the system identify the appropriate inputs, namely +Ve and -Ve. Please ensure your junction box has a suitably rated cable gland to prevent water ingress.

Important notices to all customers
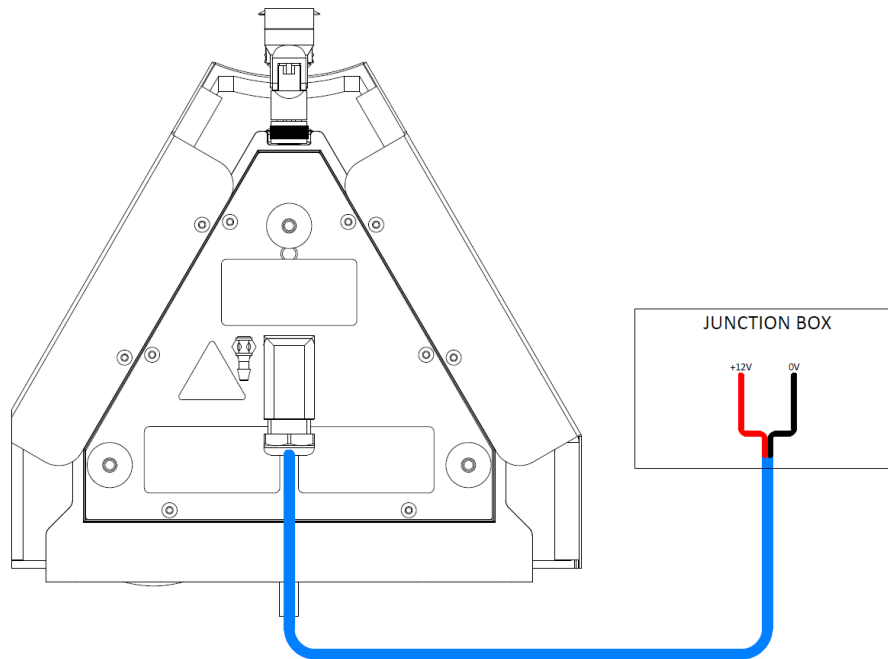
Wiring diagram 2 – external DC supply wiring

3.6 How to connect the external high capacity battery pack

Specified at time of manufacture both the AQMesh pod and external high capacity battery pack are supplied with appropriate arctic grade 2-core flex. Simply connect together using the inline connector provided.
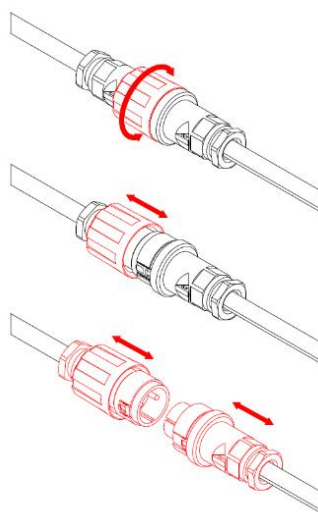
3.7 How to connect the solar panel assembly

Specified at time of manufacture both the AQMesh pod and solar panel assembly are supplied with appropriate arctic grade 2-core flex. Simply connect together using the inline connector provided.

3.8 NiMH rechargable battery / charging

The NiMH battery used in the AQMesh is a nickel metal hydride pack and is manufactured specifically for AQMesh as a pack from three individual cells. This type of battery is not so susceptible to the top-up charging 'memory effects' as nickel cadmium batteries, although it is not recommended that the pack is given small top-up charges.

⚠ **Warning**	The battery charger is NOT suitable for use in the field. The battery must be charged indoors in a safe area.

Important notices to all customers

The battery charger is intelligent and will indicate when the unit is charging and has charged. The charger should only be disconnected when fully charged is indicated.

- Charging   flashes green
- Ready   lights green
- Error   flashes red

The pack must be charged ONLY using the battery charger supplied with the pack. The battery charger supplied is intended for indoor use only. Please ensure adequate ventilation whilst charging.

✍ Note: Connect the charger to the mains attaching the appropriate adaptor. Contact The manufacturer (UK) Limited for further information

Charger: Input voltage: 100-240V A/C +/- 10%
          Input frequency: 50-60Hz +/- 10%
          Input power: 58W

          Output voltage: 12V D/C max
          Output current: 2.5A max

A full charge will take approximately 3-4 hours. The operating life will depend on the AQMesh configuration and measurement strategy. In default mode 'gas only' will last approximately 3-4 months. Particulate measurements use considerably more power and will last approximately 1 month in default mode. The ambient temperature can dramatically affect NiMH battery life; please take this into account when estimating battery life.

3.9   Changing the battery

The battery fitted to the pod should be changed as required by the measurement scheme.

1. Remove the six screws holding the back plate in position and remove the plate. Taking care not to damage any wires or tubing that may be attached.

2. Slide the ON/OFF switch into the OFF position.

3. Disconnect the power connector and remove the battery pack by sliding it towards you.

4. Fit and connect the new battery pack.

5. Slide the ON/OFF switch into the ON position.

6. Replace the back plate and secure its six screws. Take care to reposition any wires or tubing that may be connected to the back plate.

7. Following battery replacements where power is lost or removed. The memory should be cleared either locally using the serial cable or remotely via the server.

✎   Tip: It is possible to change the battery without removing the power to maintain continuous measurement where frequent battery changes are necessary. This can be achieved by connecting the new (charged) battery to the spare power connector before disconnecting the old battery. This assumes the old battery this has power and has not run flat already.

Important notices to all customers

3.10 Activation method

Where appropriate your pod is shipped with the battery in place but is switched off for safety during shipping.

? Please note: Ensure the antenna is attached prior to turning the pod on.

1. Remove the six screws holding the base plate in position and remove the plate

Base plate screws

2. Slide the ON/OFF switch into the ON position

On/off switch

OMAQM3.8
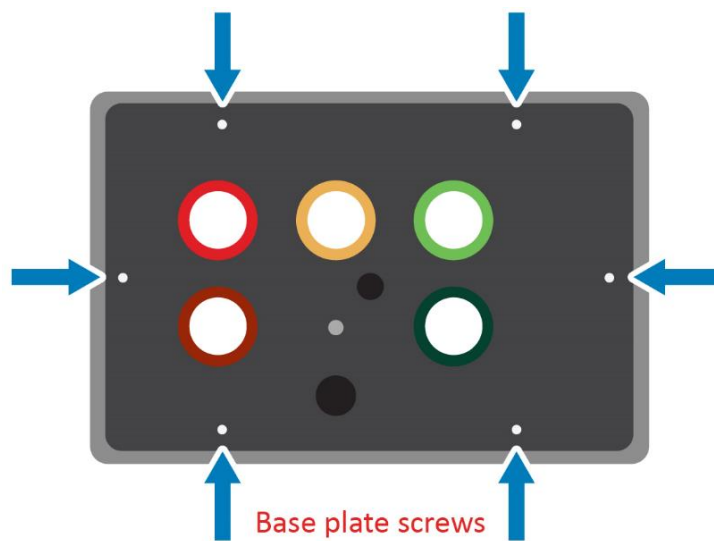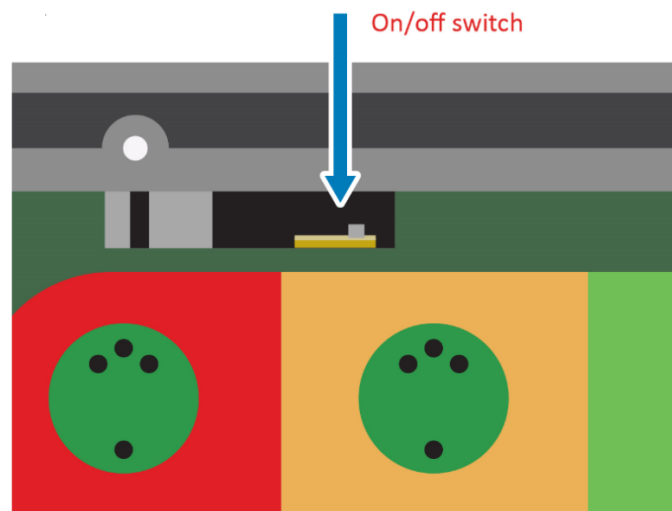
Important notices to all customers

3. Ensure the status LED located behind the window in the AQMesh label lights. The LED blinks alternatively green and red at power-up

4. Observe the LED sequence to determine the server connection is achieved (see below):-

1	Alternate green/red blink, power-up
↓	
2	Slow green blink, warming up
↓	
3	Fast green blink, connecting to the server
↓	
4	Green dot-dash, establishing a GPS lock
↓	
5	Green on for 5 seconds then permanently off, connection succeeded

✍   Please note: When the pod has successfully connected, **<u>ALL</u>** LEDs will be off. If the pod cannot make a connection immediately it will re-try every 30 minutes until a connection is made. In this case, the LEDs will go off when it makes a connection. The best way of confirming that a connection has been made is by looking at pod connections on the server.

5. Replace the base plate and secure its six screws.

6. Check the web server is receiving data from the AQMesh pod (see separate instructions in section 1.19).

Important notices to all customers

7. Install the AQMesh pod on to the mounting bracket. Locate the 3 keyhole pillars properly and slide the pod downwards to lock onto the mounting bracket.

8. Secure the AQMesh pod on to the mounting bracket using the security screw provided.

9. The sensors in your AQMesh pod may take 2 days to stabilise within its environment, followed by 2 to 4 days for base line adjustment. It is very important that this is performed in the environment in which the pod will be used and not in an office or a local test site. You can use the AQMesh server options to re-start the stabilisation period

⚠ **Warning**	If the equipment is likely to be used with equipment conforming to IEC60950 and there is a hazard due to moisture or liquids (e.g. using a PC during installation outside) please take the precautions necessary as stated by the equipment manufacturer's instructions. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

3.11 Installation FAQs

1.18.1   LED fault codes during the start-up sequence

LED Summary table
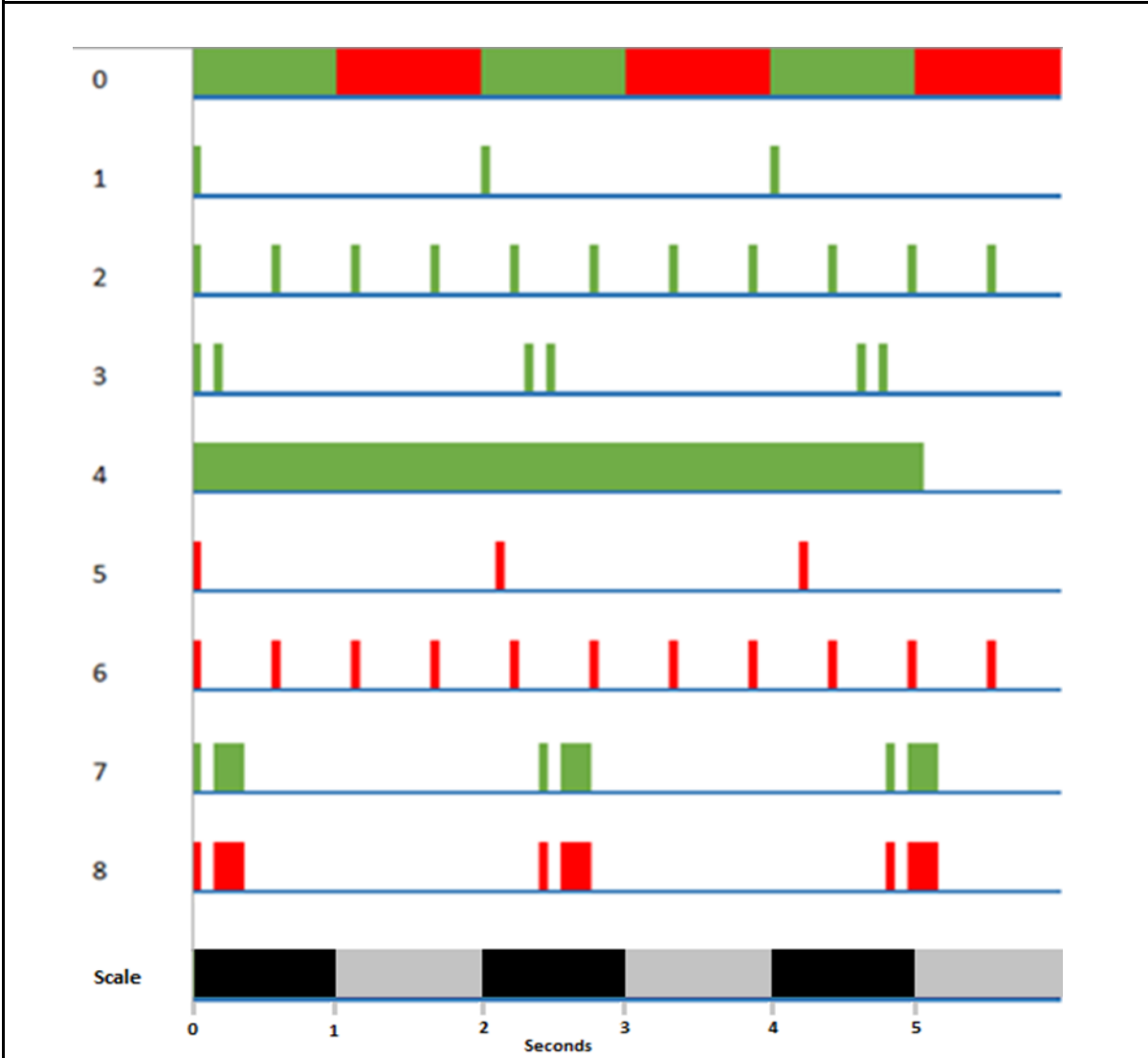
	Description
0	Power On
1	Preparing to connect to the server
2	Connecting to the server
3	Warming up
4	Connection succeeded
5	Connection failed due to a local issue **(Note[1])**
6	Connection failed due to a server issue **(Note[2])**

Important notices to all customers

7	Getting GPS Lock
8	SIM Card Error

Note[1] : A local issue can be:

- The modem cannot attach to the network (usually due to bad GSM coverage)
- The modem cannot connect to the APN (usually due to bad GSM coverage or to wrong settings)
- Unexpected error (other than above)

Note[2] : An issue with the server can be:

- Cannot connect to the server (offline or wrong settings)
- Response timeout (the server did not reply in time to a command)
- Response error (some data have been received from the server, but the format of the response is not correct)

In these instances, please contact support@aqmesh.com for further advice on rectifying the issue.

3.11.2 Changing a sensor

⚠ **Warning**	Always ensure that you refer and comply with the relevant National Working at Heights regulations prior to any installation work.

You will be notified by email if any of the sensors in your AQMesh pod have failed. Changing a sensor involves two steps. In addition to replacing the sensor in the pod itself, the web-server needs updating to associate the relevant calibration data (stored on the server) with the new sensor. Please follow the steps below:-

✎ Note: Important - DO NOT INSERT OR REMOVE THE GAS SENSORS WHILE THE POWER IS ON AS IT CAN DAMAGE THE SENSORS.

On the AQMesh server:

✎ Note: The server update must be done at the time the sensor is physically changed in the pod or after, as changing the sensor serial number triggers automatic re-basing.

1. Login to the AQMesh web application using you user ID and password
2. Select the correct AQMesh pod.
3. Please confirm the sensor has been changed using the link in your notification email. Alternatively, enter the new sensor's barcode in to the field for the appropriate sensor type and confirm the update.

On the AQMesh pod:

4. Remove the six screws holding the sensor plate in position and remove the plate.
5. Slide the power ON/OFF switch into the OFF position.
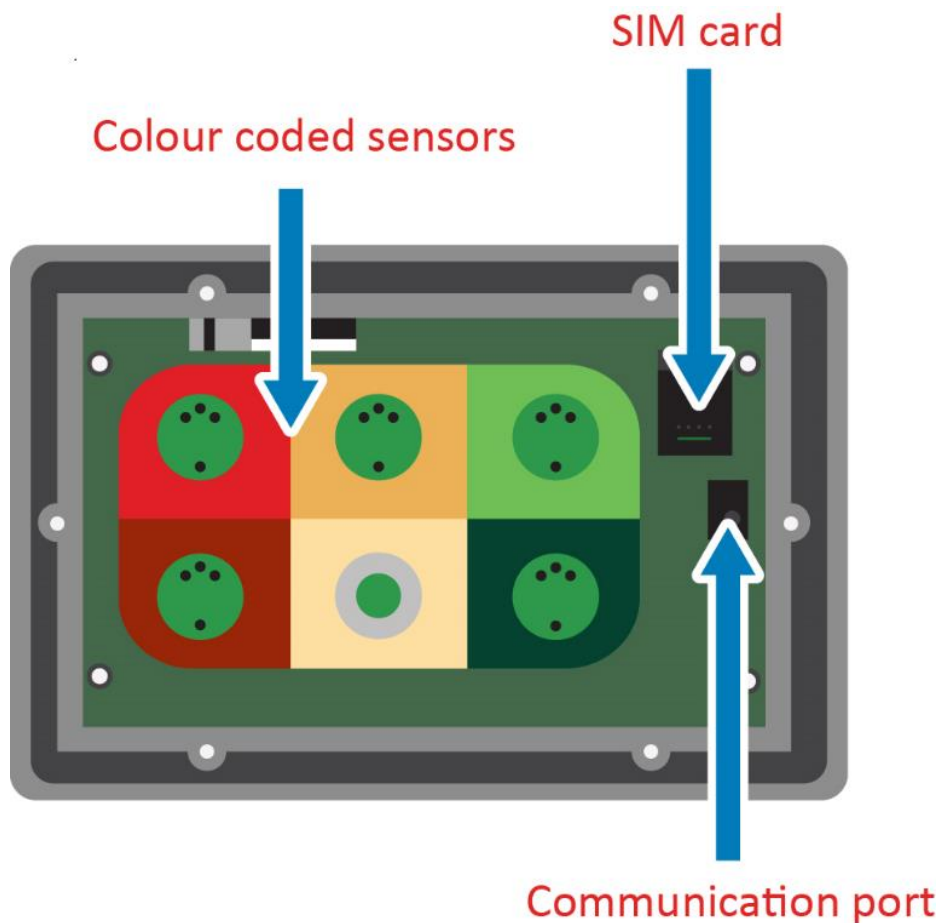
6. Locate and carefully remove the required sensor from its socket. It pulls straight out but may require some gentle force.
7. Should any residue remain on the PCB, this should be cleaned.
8. Carefully insert the new sensor in position taking care not to damage the sensitive gas interface membrane on its surface
9. Slide the ON/OFF switch into the ON position.

Important notices to all customers

10. Ensure the status LED located behind the window in the AQMesh label lights
11. Observe the LED sequence to determine the server connection is achieved
12. Replace the sensor plate and secure in position with its six screws
13. Check the web server is receiving data from the AQMesh pod (see separate instructions)
14. The sensors in your AQMesh pod may take 2 days to stabilise within its environment, followed by 2 to 4 days for base line adjustment
15. Failed sensors should be returned to your distributor or the manufacturer as soon as possible.

Please note…Sensor failures are almost certainly caused by high ambient RH% / low temperature and the sensors are most vulnerable during periods of sustained high humidity. It is important that the pod is opened quickly as the failed sensor can leak electrolyte and damage the PCB. We suggest you use gloves to handle failed sensors as the electrolyte is a weak acid (only equivalent to lemon juice).

The risk of failure is worst when pods are moved around / shipped. Please ensure that RH / temp is changed gradually and the pods are handled gently, particularly when they may have been exposed to high RH%. For example, when we bring pods indoors we leave them to sit in cool, dry conditions for 24 hours before taking them fully indoors.

Please be aware that it is important that the sensor serial number is changed on the server soon after the sensor is replaced so that the correct correction figures are used by the algorithm and stabilisation / baselining is triggered correctly.

All failed sensors are replaced under warranty in the first year.

3.12 Getting online

Each AQMesh pod is automatically registered on the AQMesh server when it is manufactured. The pods are then assigned to a distributor who will in turn assign them to the user and open an AQMesh online account for the user.

You should have received your username and password from your local distributor with this shipment. If you have not received login details please contact your local distributor.

Once your pod is activated log in to the AQMesh server.

Each pod can be selected and the setup and details can be viewed or changed dependent on your access privileges. Data can also be viewed in tabular or graphical formats.

You may amend your account details and change your password at any time.

You may also access additional technical assistance, download AQMesh resources or renew or upgrade your account at any time at via the link on http://www.aqmesh.com/.

Important notices to all customers

3.13 AQMesh pod technical specification

Gases monitored	Up to five gases – NO, NO2, ozone, CO, SO2
Other measured parameters	Particulates, temperature, pressure, & humidity
Power options	See table 2.5
Communications	Wireless GSM communication
Physical	Enclosure - Polyurethane moulded or ABS Approx size - 160x220x230mm (not inc. antenna 180mm) Weight - <2.5Kg Protection - IP65

3.14 Solar power unit technical specification

Power	Panel 15W – 0.86A Polycrystalline array. Battery 12V – 8Ah Sealed Deep cycle AGM lead acid 2.5 Ampere fuse
Battery life	Up to 2 years
Physical	Enclosure Aluminium. Approx.Size L465xW250xD280mm Weight 5.5Kg Protection IP65
Environmental	Temperature range: -20 to +80 DegC
Information	Built in power controller with integrated over-charge protection. Custom AQMesh connector for easy connection to AQMesh products. Allows continuous AQMesh pod operation in UK winter.

Product designs and specifications are subject to change without prior notice. The user is responsible for determining the suitability of the product. # Maybe subject to carrier shipping restrictions. The battery fitted to this equipment have passed vibration, pressure differential

Important notices to all customers

and free flowing acid tests under 49 CFR173.159a, meet IATA Special Provisions A48, A67, A164 & A183, and IMDG Special Provisions 238.1 & 238.2. The batteries are securely packaged, protected from short circuits and labeled "Non-Spillable" and are therefore exempt from DOT Hazardous Material Regulations, IATA Dangerous Goods Regulations, and IMDG Code..

3.15 Warranty policy

This analyser is guaranteed, to the original end user purchaser, against defect in materials and workmanship for 12 months from the date of the shipment to the user. During this period the manufacturer will repair or replace defective parts on an exchange basis. The decision to repair or replace will be determined during repair.

To maintain this warranty, the purchaser must perform the installation and maintenance as prescribed in the operating manual. Only parts supplied by the manufacturer or its authorised distributors should be fitted. Normal wear and tear, and parts damaged by abuse, misuse, negligence or accidents are specifically excluded from the warranty.

Electrochemical sensors carry a 12 month warranty.

The manufacturer will repair or replace (at the manufacturer's discretion) any goods supplied by the company in respect to defects arising within **12 months** from date of purchase or delivery, whichever is later, provided that:

The defect is due to faulty parts or workmanship provided by the manufacturer.

Proof of delivery/purchase must be provided to the manufacturer for any claims. This includes the manufacturer sales order, invoice, or delivery note.

All warranty repairs can only be carried out by the manufacturer or its authorised agents. In certain circumstances, permission may be granted by the manufacturer for the owner to replace a supplied part under warranty.

Any repair or replacement component under warranty will not extend the warranty period of the system.

Products must have been returned for service and calibration as recommended by the manufacturer or its authorised agents.

Where replacement parts have been supplied by the manufacturer under warranty, the replaced parts must be returned to the manufacturer. If not

returned, the manufacturer reserve the right to charge for the replacement part.

If no fault is found an investigation charge may apply.

Technical support MUST be notified in the event of a pending warranty claim. They will then issue a warranty reference number that must be included in any return. Failure to provide this will void any warranty claim.

The following is not included:

Normal wear and tear of parts that might wear out over time, or be consumed, is not covered. Parts not covered include, but not limited to, the pump and tubing.

A service is not part of a warranty claim.

Accidental damage, including dropping during installation.

Damage as a result of vandalism or theft.

Faults arising from use of the equipment that is not in accordance with standard operating procedures laid out in the manufacturer's operating manual.

Faults arising from use of the equipment in unsuitable applications.

Repairs or alterations carried out by parties other than the manufacturer, its authorised agents, or under the instruction of the manufacturer.

Any data stored on the equipment that may be lost.

A claim due to a failure in maintaining the system in accordance with the operating manual.

A claim as a result of poor quality or inadequate repairs.

Any business-related losses such as income, profits, and contracts (as far as the law allows).

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The following voids the warranty:

When non-approved manufacturer parts have been used for repair or maintenance.

When parts are added, or alterations made, to the system outside the scope of the operating manual.

The AQMesh pod has been opened in poor weather conditions that have resulted in damage to any of its components.

The equipment has been stored or installed outside of the operating range and environmental conditions determined in the operating manual.

? Please note: Warranty repair is only granted after an investigation by the manufacturer.

? Please note: For assistance in determining if your equipment qualifies for warranty investigation, please contact your local distributor, or our technical support team at the manufacturer on +44(0)1789 777703 or email support@aqmesh.com

? Please note: For any other queries please contact your local distributor, or our sales team at the manufacturer on +44(0)1789 777703 or email info@aqmesh.com

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3.16 WEEE compliance

The wheelie bin symbol displayed on equipment supplied by the manufacturer signifies that the apparatus must **NOT** be disposed of through the normal municipal waste stream but through a registered recycling scheme.

The Waste Electrical and Electronic Equipment Directive (WEEE) make producers responsible in meeting their obligations, with the fundamental aim of reducing the environmental impact of electrical and electronic equipment at the end of its life.

The manufacturer is registered with the Environment Agency as a producer and has joined a recycling scheme provider that manage and report on our electrical waste on our behalf.

Our producer registration number is WEE/FB5573RX

When your equipment (pod or sensor) is at the end of its life, please contact the manufacturer who will advise you on the next steps in order to help us meet our obligations.

Important notices to all customers

3.17 Battery disposal considerations

Lithium-thionyl chloride batteries do not contain hazardous materials according to EC directives 91/157/EEC, 93/86/EEC, and 2011/65/EU (RoHS directive). The reaction products are inorganic and do not represent environmental hazards, once the decomposition or neutralization process has terminated. The batteries are free of mercury, lead, manganese, and cadmium.

NiMH batteries

EC battery directive 2006/66/EC has been implemented by most EC member states.

According to the EU Battery Directive, batteries are marked with the symbol of the crossed out wheeled bin (see figure above). The symbol reminds the end user that batteries are not permitted to be disposed of with household waste, but must be collected separately in accordance with applicable local regulations.

Do NOT incinerate.

Waste batteries must be effectively protected against short circuit during storage and transportation.

 Note: Please contact support@aqmesh.com for further information

Important notices to all customers

3.18 Declaration of Conformity

Important notices to all customers

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Declaration of Conformity

In accordance with BS EN ISO/IEC 17050-1:2010

We -   Environmental Instruments Ltd.

Of -   Unit 5, The Mansley Centre, Timothy's Bridge Road,
              Stratford-upon-Avon, CV37 9NQ. UK

Declares that under our own responsibility the following products:

Name	AQMesh
Description	A range of wireless outdoor air quality monitors measuring various atmospheric gases, particles and other parameters.
Models	AQMGXX-XX, AQMGPXX-XX and AQMPXX-XX

In accordance with the following directives:

R&TTE Directive 1999/5/EC	The Radio and Telecommunications Terminal Equipment (R&TTE) Directive.

Has been designed and manufactured to the following harmonized standards and specifications:

EN 301-489-1 V1.9.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.
EN301-489-7 V1.3.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS).
EN301 511 V9.0.2	Global System for Mobile communications (GSM); Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC).
EN61010-1-2010	Safety requirements for electrical equipment for measurement, control, and laboratory use -- Part 1: General requirements.

Signed by:

Name : Mr Stephen Earp   Position : Technical Director

Done at : Environmental instruments, Warwickshire, UK   On: 01/01/2015

Last two digits of the year that CE marking was first affixed : 13

Iss.01

Registered in England and Wales: 02741434
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